



Populations and Ecosystems Ecoscenarios



Monongahela National Forest

INTRODUCTION





Carr Clifton, Minden Pictures

Fall colors of deciduous trees in Monongahela National Forest.

Monongahela National Forest is located in the Allegheny Mountains of West Virginia. This national forest covers over 364,000 hectares (909,000 acres) in the eastern part of the state, spread across ten West Virginia counties, and is the fourth largest national forest in the northeast United States. The landscape is rugged with spectacular views of exposed rocks, spring floral displays, and the changing fall leaves of the [deciduous forest](#).



Monongahela National Forest covers a large area in eastern West Virginia.

In the 1880s forests in the Allegheny Mountains and throughout the Northeast were extensively logged for timber. Clear-cut logging removed all vegetation in many areas. This increased the erosion of soil, which washed into streams and polluted water with mud and silt. In the Monongahela region, two major forest fires, one starting near a Civil War camp and another by lumbering activity, further increased the amount of silt washed into streams.

President Theodore Roosevelt created the National Forest Service to protect forests and watersheds and to prevent further damage. In 1908 the U.S. Congress allocated money to determine which watersheds should be protected. In 1911 the Weeks Act passed, allowing the Forest Service to acquire forested land that would help protect these watersheds. Among the first lands bought was 2900 hectares (7200 acres) near the Monongahela river. This land became Monongahela National Forest on April 28, 1920.



Courtesy of John Warner

The Monongahela River is one of six rivers with headwaters in Monongahela National Forest.

The U.S. Forest Service's mission was to promote the most beneficial use of the forest resources without damaging the native environment. Prior to the creation of the National Forest Service, most forests were harvested for the large trees that yield the most lumber. Smaller, immature trees were cut to make removal of the larger trees easier and were left to decay where they fell. Most logging operations began at the mouth of a river and worked upward, toward the headwaters. It was believed that, by the time the operation reached the headwaters the forest at the mouth would have regenerated. But as logging operations became bigger and more efficient at removing trees, many watersheds were completely logged before any regrowth had occurred.

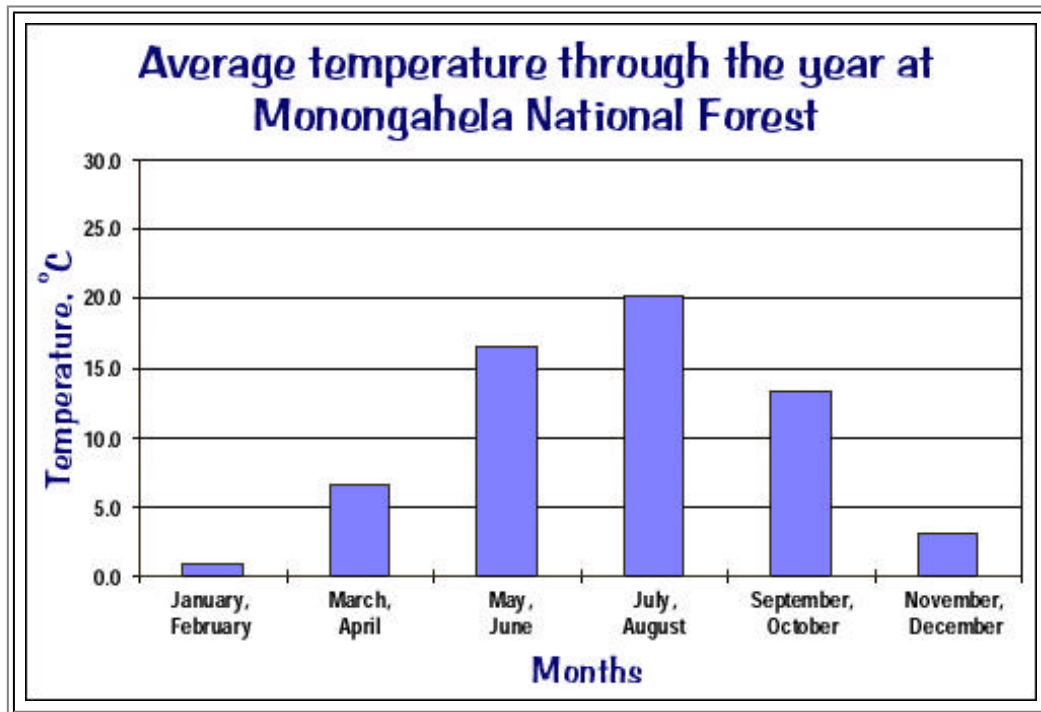
The Monongahela area was covered with virgin spruce forest, mixed with [hemlock](#), [white oak](#), and poplar prior to logging. Today, the forest is primarily a second-growth forest of more than 75 species of trees, such as [black cherry](#), oak, [hemlock](#), and poplar, with some spruce.

Monongahela National Forest is a popular vacation area. It is within a day's drive of one-third of the population in the United States and is a popular destination for camping, hiking, fishing, and hunting. Elevations in the rugged terrain range from 274 to 1482 meters (899 to 4861 feet). The headwaters for the Monongahela, Potomac, Greenbrier, Elk, Tygart, and Gauley Rivers lie within the forest.

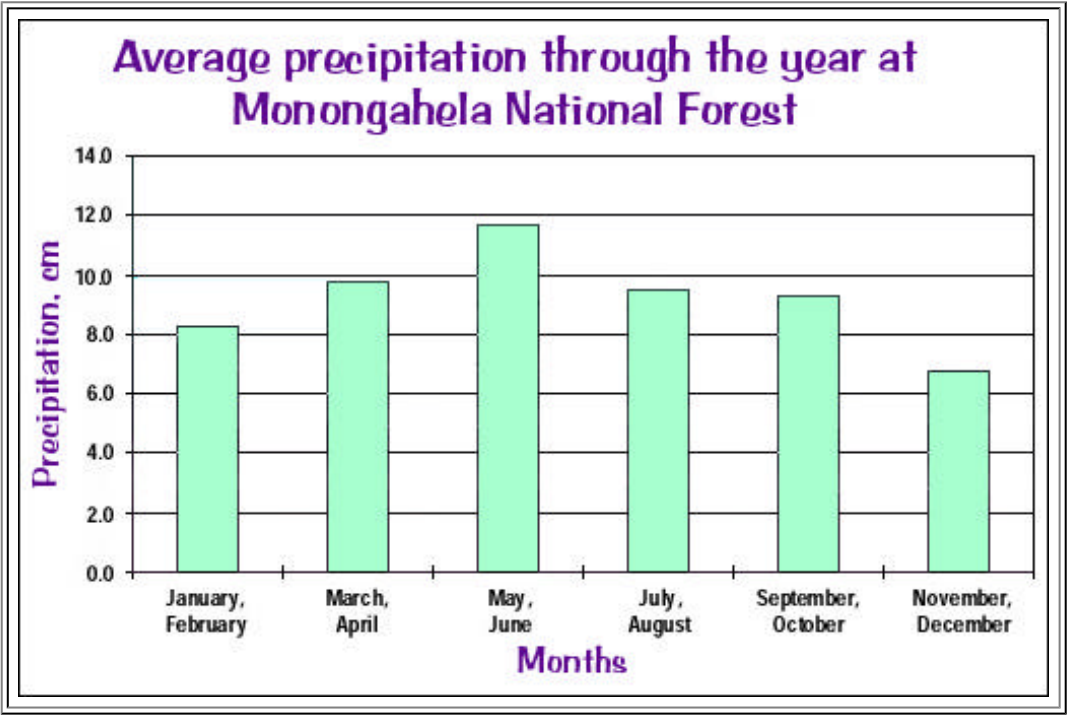
The forest also provides jobs and income to the local economy through the lumber industry, as well as coal mining and natural gas wells. Management of these natural resources is monitored by the U.S. Forest Service.

ABIOTIC DATA

The climate at Monongahela National Forest is characterized by warm summers and cold winters. In the summer, the temperature averages 19.7°C (67.5°F). In the winter, it drops to 1°C (33.8°F). Sometimes there is snow, but most of the precipitation falls as rain. The peak growing season is about 6 months long, slowing in the fall and winter due to cold temperatures and snowfall.



There are no distinct wet and dry seasons. A rain shadow affects the amount of rain received on the west and east sides of the forest. Storms usually come from the west, dropping most of their moisture as they rise over the Allegheny Mountains. As the storm passes over the eastern half of the forest, two-thirds of the moisture has already fallen as rain. In some years, the western half of Monongahela National Forest may receive as much as 150 centimeters (60 inches) of precipitation, while the eastern half receives only 75 centimeters (30 inches).

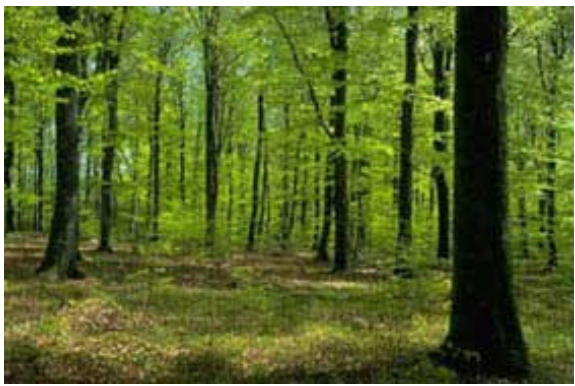



Elevation varies considerably in Monongahela National Forest. The lowest elevation is 275 meters (902 feet) at Petersburg. The highest peak is Spruce Knob, with an elevation of 1482 meters (4861 ft.).

The soil and substrate in Monongahela National Forest is a deep layer of organic material formed from decaying leaves and wood.

BIOTIC DATA

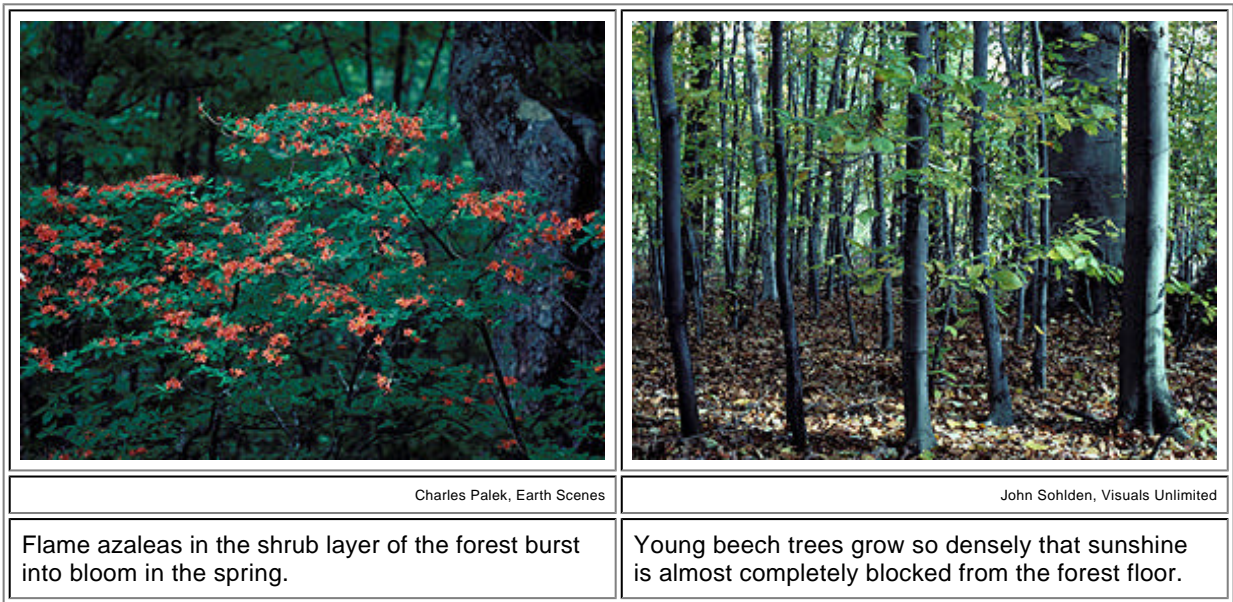
Forests, including the deciduous forest at Monongahela, have layers. The canopy layer, includes the tops of the tallest trees. Below that is a layer of saplings and small trees. The shrub and herb layer is closer to the ground and is sometimes called the understory. On the forest floor is the ground layer, covered in the shortest plants and leaf litter.

	
Art Explosion	Courtesy of U.S. Department of Agriculture, Forest Service
The understory of the deciduous forest contains mosses, ferns, lichens, and herbaceous plants.	Springs and small streams throughout the forest keep the forest floor moist.

In Monongahela National Forest there are 75 species of trees, including the [sugar maple](#). This canopy tree stands 21–30 meters (70–100 feet) tall. In the trees live many species of birds. Over 230 species, including [robins](#), [woodcocks](#), and [wild turkeys](#), are known to live in the forest, either year-round or during migrations. The trees with birds also harbor [squirrels](#),

bats, and insects. In the tallest trees, [flying squirrels](#) can be seen gliding from tree to tree.

Saplings of [sugar maple](#) trees are mixed with adult [American beech](#) and [black cherry](#) trees. These trees prefer well-drained soils, so might grow in areas a little too dry for sugar maples. Beech trees provide very dense shade in summer under which very few plants can grow.



Where the shade from the canopy and sapling layers is not too dense, there is a shrub layer. In open woodlands areas [catawba rhododendrons](#), [red elderberry](#), and [flame azaleas](#) grow and bloom. The flowers of these woody shrubs brighten the forest in late May and early June. Fruit from the cherry trees and elderberries attract birds, [raccoons](#), [opossums](#), [white-tailed deer](#), [black bears](#), and humans.

In open areas in or near the forest live other animals like the [red fox](#) and the [woodchuck](#). [Black bears](#), [skunks](#), and [white-tailed deer](#) wander across the forest, looking for food and shelter. [Raccoons](#), [bobcats](#), and [opossums](#) also climb in the trees.

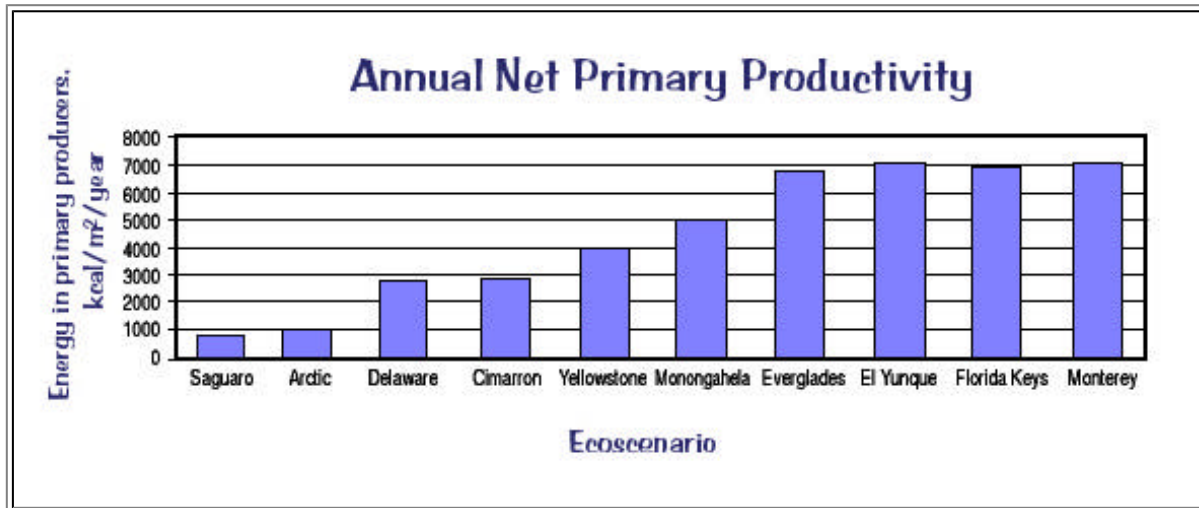


Near streams, where elderberries grow, is a good place to look for [spotted salamanders](#). They spend most of their time in the moist forest soil and leaf litter. Tree trunks near streams often bear the toothmarks of [American beavers](#), which use logs to build dams and lodges. The [fisher](#), a weasel, is often found near water, but generally avoids open spaces.

[Round-leaved sundews](#) grow in wetter areas of the open woodlands. Insects attracted to the sundew get caught on its sticky leaves. Chemicals in this sticky sap slowly break down the dead insects, and the sundew absorbs the nutrients.

The ground layer contains a mixture of [lichens](#), clubmosses, and [moss](#). These organisms, along with the roots of the taller plants, help keep the soil in place. Moss covers the ground in damp shady places, and may grow at the base of tree trunks or on decaying stumps. [Mushrooms](#), [earthworms](#), and [bacteria](#) are also important in this layer, as they break down detritus and return nutrients to the soil.

Annual productivity, or the amount of energy provided by the producers in this ecosystem, is high, about 4650 kilocalories/square meter/year of plant material.



Except for 52 hectares (130 acres) the deciduous forest of Monongahela today is a secondary forest. Secondary forests are seldom as diverse as the primary, or original old-growth, forest. The trees tend to be smaller, both because older trees have been removed and because growth is stunted. More than a century ago, in Monongahela National Forest, the primary trees were spruce and [white pine](#) with interspersed hardwood, or deciduous, trees. There were some very large trees. [Hemlocks](#), white oaks, and poplars had diameters of almost 2 meters (6.5 feet). The understory was predominantly laurels. A remnant of this virgin forest, the Gaudineer Knob Scenic Area, was spared from logging.

ISSUES

The mission of the U.S. Forest Service is to manage the resources of forest and grasslands for the public. It was originally established in 1905 to provide quality water and timber to the country. Congress directed the Forest Service to manage the renewable resources as well as public recreational use.

Its mission also includes active research in the fields of forestry, rangeland management, and forest resource utilization. At issue in Monongahela National Forest is how logging activities should be conducted within the forest boundaries.

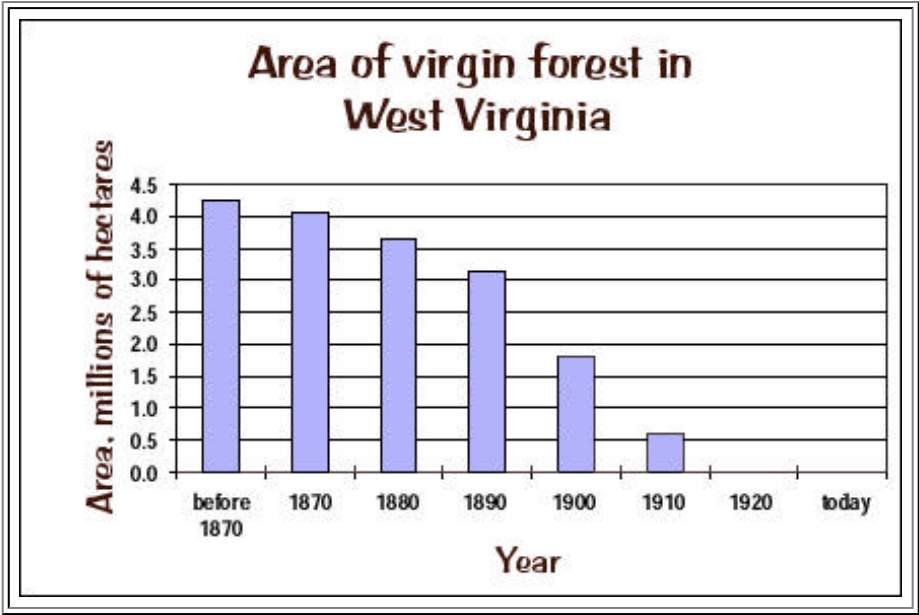
How are natural and logged forests different?

Before logging, forests experienced gaps and thinning only when trees fell naturally due to age, disease, or animal action like beaver gnawing. A forest had tipped-up roots, dead snags, and downed trees. These created habitat for birds and other animals.

Forestry techniques vary, from the cutting of single trees, to cutting small plots at different times, to clear cutting large areas. Anything except cutting of single trees leads to areas where all the trees are the same age and height, and the understory is very simple. Trees are harvested for commercial purposes before they die a natural death.

	
Courtesy of John Warner	Courtesy of Steve Holmer, American Lands Alliance
Blackwater Canyon is privately owned land that borders Monongahela National Forest. It has recently been opened to logging.	Temporary road cut through Monongahela National Forest to remove felled trees.

In most logging operations, roads are built to get equipment and trucks into the area. Logs are hauled offsite to a mill, cut into boards, and sold by the lumber companies.



Logging in West Virginia

In the early 1800s, the forests of West Virginia were filled with large spruce, [hemlock](#), white oak, and poplar trees. These trees were attractive to logging interests, which began clearing the trees for lumber. Spruce and [pine](#) trees were the first trees cut, because their trunks float in water, making transportation to sawmills easier. When the spruce trees had mostly been cut, logging efforts focused on other species. [Black cherry](#) and white oak were the most valuable timber hardwoods.

At first, lumbering progress was slow because it used inefficient techniques like simple cross-cutting and water-powered mills. In 1880 circular saws and steam engines arrived, and large-scale "production" milling began. A few years later, logging techniques advanced with the addition of band saws, which could cut logs into boards very quickly. It would take 7 hectares (17 acres) of trees a day to keep a band-saw mill running. A new type of locomotive engine, called the Shay locomotive, further increased logging activity. Because it could climb hills and make sharper turns, this engine allowed trains to be used to remove logs.

Between 1880 and 1920 most of the forests in West Virginia had been logged. When large trees are cleared from a forest, there are fewer living plants to help keep the soil intact. Silt and soil ran into streams, polluting streams and the downstream watersheds. The ash and soot from forest fires in the area, started by Civil War activity or logging operations, further damaged waterways. Because people need fresh water for drinking, bathing, agriculture, and industry, this pollution was not desirable.

In 1905 the U.S. Congress gave the Forest Service money to determine which watersheds should be protected. The Forest Service needed to acquire the rights to forested land near these watershed to keep them from being damaged. The Weeks Act in 1911 allowed it to do this. The land that became Monongahela National Forest was among the first areas the Forest Service purchased.

Most of the forested areas in Monongahela National Forest today are secondary forests. The old-growth trees were clear-cut between 1880 and 1920, because bigger trees mean better boards with fewer knots. Logging practices continue in Monongahela National Forest, such as removing single trees or clear-cutting 10-hectare (25-acres) blocks.

Current logging laws

Some government officials, such as Georgia representative Cynthia McKinney, are sponsoring an act that would end the sale of timber from federal lands, and would help restore 100 years of damage to national forests.

Before leaving office, President Bill Clinton signed a plan that would make 24 million hectares (60 million acres) off limits to new roads and most logging. This plan includes 31% of all U.S. Forest Service lands. Under this plan, some current logging operations could continue, but new projects would not be allowed. As of spring 2002, this plan was still under review.

THE DEBATE

Before making decisions that affect an ecosystem, it is important to gather information from a variety of sources. Below are the views of several individuals or groups that have an interest in the future of the Monongahela National Forest. After each quote the hyperlink goes to the original source of the quote. Refer to these sites for more information.

Use the information provided to decide where you stand on this debate.

DEBATE: How should logging be conducted in national forests?

People who support increased logging in national forests

Steven J. Milauskas, forest operations specialist, West Virginia University Appalachian Hardwood Center, What Is Low-Impact Logging?

"Generally, gentle logging systems incorporate several practices that most foresters, landowners, and conscientious loggers could agree on regardless of the type of equipment used...having a good understanding among landowner, logger, and forester of how the site will be harvested, what will be removed, how it will be removed, and measures taken to protect and enhance the remaining stand of trees."

<http://www.wvu.edu/~agexten/forestry/logging.htm>

Logging company operator

"There are new laws in place that regulate how logging operators conduct the logging so that we protect the environment and don't pollute the rivers. If we increase our production, we still have to follow those guidelines. If we don't, we get hit with some pretty big fines."

West Virginia Logging Sediment Control Act

"The law, and accompanying regulations, empowers the Division of Forestry to issue compliance orders to correct problems and, when necessary, to suspend a logging operation until specified corrections are made to bring the operation into compliance with the law. The operation may be immediately suspended when human life is endangered, uncorrectable damage to the environment is imminent, an operator is not licensed, uncorrectable water pollution may result, or a certified logger is not supervising the operation."

<http://www.wvu.edu/~exten/depts/af/ahc/wvlscsca.pdf> (pdf file)

People who discourage increased logging in national forests

Woodworker

"A lot of products come from the forest without having to cut all of the trees down. If the forest is clear-cut, all of those industries will be affected."

William N. Grafton, wildlife specialist, West Virginia University Extension Service, Forest Provides Income from Crafts, Edibles, and More

"A typical logging operation removes only the best wood and leaves the rest behind. This 'rest' includes the stumps, knots, burls, and tree forks that craftsmen prefer for bowls, carvings, tabletops, etc. These tree sections contain the fancy, wavy, swirling grain patterns valued by craftsmen."

<http://www.wvu.edu/~agexten/forestry/frestinc.htm>



Lumber company owner

"We have always cut timber on federal lands. They are the forestry experts and manage it so my company will have timber to cut into the future."

U.S. Department of Agriculture, Forest Service, Mission Statement

"Mission: The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations."

<http://www.fs.fed.us/aboutus/mission.shtml>

	
Art Explosion	Art Explosion
Homes, paper, furniture, and other products are made from wood.	Much of the wood logged in Monongahela National Forest has been used to build furniture, like rocking chairs.

Questions

- Which side of this debate do you support?
- What scientific evidence supports your position?
- After looking at the evidence, did you change your position? Please explain why.

WEB LINKS

U.S. Department of Agriculture, Forest Service, Monongahela National Forest - <http://www.fs.fed.us/r9/mnf/index.shtml>

Appalachian Focus Logging News, *Man Imprisoned for Selling Stolen Monongahela Trees* - <http://www.appalachianfocus.org/logging1/00000038.htm>

Charleston Gazette Online, *The Forest for the Trees* - <http://www.wvgazette.com/static/series/timber/>

Environmental News Service, *National Forest Logging Costs Outweigh Benefits* - <http://ens-news.com/ens/mar2000/2000-03-13-06.asp>

Environmental News Service, *Judge Blocks National Forest Roadless Rule* - <http://ens-news.com/ens/may2001/2001-05-11-06.asp>

Gerald Williams, Forest History Society, *Controversy over Clearcutting*, - <http://www.lib.duke.edu/forest/usfscoll/policy/>

[Forest Management/Clearcutting/index.html](http://www.wvu.edu/~agexten/forestry/logging.htm)

Steven J. Milauskas, forest operations specialist, West Virginia University Appalachian Hardwood Center, *What Is Low-Impact Logging?* - <http://www.wvu.edu/~agexten/forestry/logging.htm>

Tom Cain, Fisheries Biologist, Monongahela National Forest, West Virginia Watershed Network, *Lessons from Seneca Creek* - <http://www.nrac.wvu.edu/wvwn/newsletters/summer98/seneca.htm>

U.S. Department of Agriculture, Forest Service, The Fernow Experimental Forest - <http://www.fs.fed.us/ne/parsons/fehome.htm>

U.S. Department of Agriculture, Forest Service, *Mission Statement* - <http://www.fs.fed.us/aboutus/mission.shtml>

U.S. Department of Agriculture, Forest Service, Monongahela National Forest, *Forest Planning* - http://www.fs.fed.us/r9/mnf/environmental/environmental_index.htm

U.S. Department of Agriculture, Forest Service, Monongahela National Forest, *Wilderness Areas* - http://www.fs.fed.us/r9/mnf/sp/wilderness_areas.htm

U.S. Environmental Protection Agency, *Glady Fork Environmental Impact Statement*, Monongahela National Forest, Randolph and Tucker Counties, West Virginia - <http://www.epa.gov/fedrgstr/EPA-IMPACT/2002/July/Day-05/i16816.htm>

Water Quality and Best Management Plans for Loggers - <http://www.usabmp.net/launch.html?state=wv>

Watershed Atlas, *Explore the Monongahela Watershed* - http://www.watershedatlas.org/fs_explmon.html

Westvaco Natural Resources Center, *West Virginia Forestry Facts* - <http://www.caf.wvu.edu/westvaco/facts.htm>

West Virginia Division of Natural Resources, *Black Bear Research in Southern West Virginia* - <http://www.dnr.state.wv.us/wvhunting/bbrp.htm>

West Virginia Division of Natural Resources, *Research Updates* - <http://www.dnr.state.wv.us/wvhunting/research.htm>

West Virginia Logging Sediment Control Act - <http://www.wvu.edu/~exten/depts/af/ahc/wvlscs.pdf> (pdf file)

West Virginia University Extension Service, Center for Agriculture, Natural Resources, and Community Development, *Forestry and Wood Products* - <http://www.wvu.edu/~agexten/forestry/forestry.htm>

West Virginia Watershed Network - <http://www.nrac.wvu.edu/wvwn/>

William N. Grafton, wildlife specialist, West Virginia University Extension Service, *Forest Provides Income from Crafts, Edibles, and More* - <http://www.wvu.edu/~agexten/forestry/frestinc.htm>
